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Dissertation on anaesthetics

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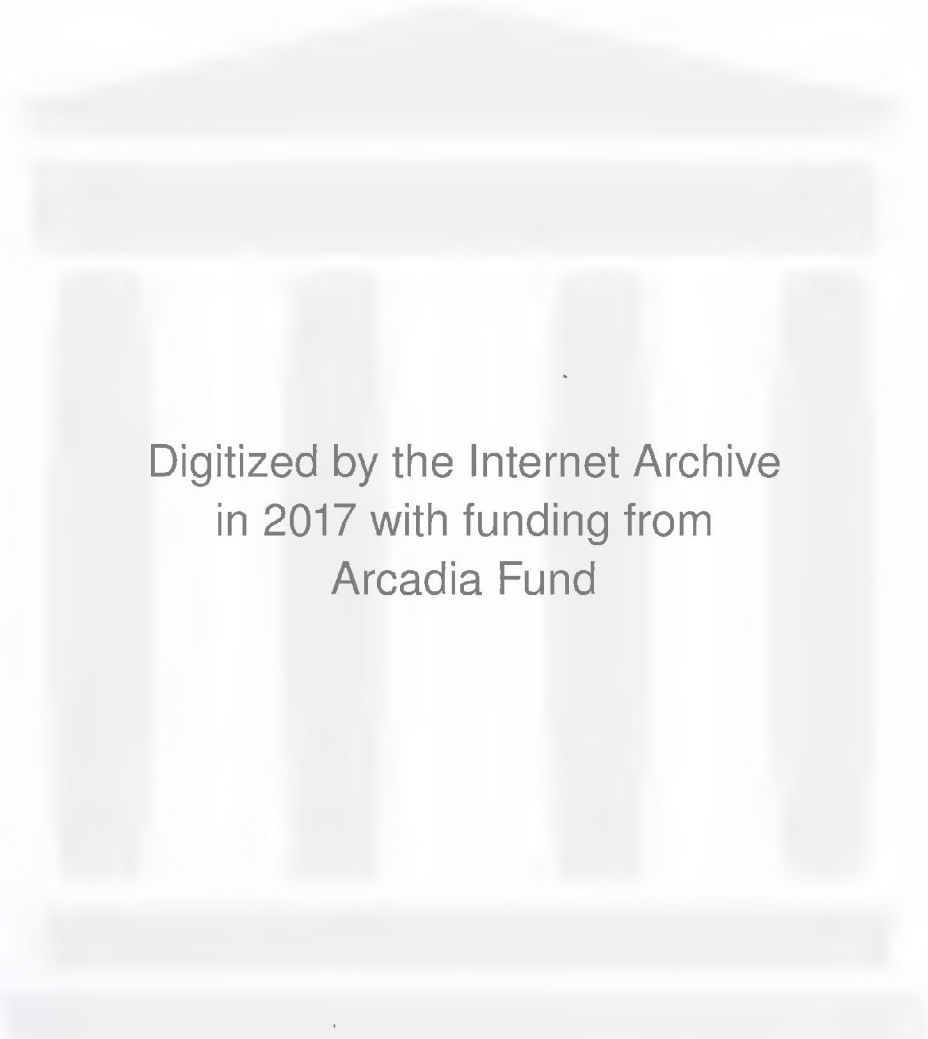

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Anæsthetics

By the term anæsthetics, is meant those agents which produce insensibility either partial or entire. There are several agents belonging to this class. The principal ones of which are. Chloroform. Sulphuric Ether. Dutch Liquid or Chloride of Olefient Gas. Common Coal Gas Bromform. & Nitrous Oxide. As the two first have been used chiefly as anæsthetics I shall confine what I have to say to them, and more particularly to Chloroform. Although the other agents above mentioned, have been experimented with and found to possess powerful anæsthetic properties, they have not been used to any great extent The Dutch liquid in general properties, much resembles chloroform. One writer remarks that a comparison of experiments with chloroform & the Chloride of olefiant gas, will show, that in no one respect, is the former, fluid superior to the latter. Coal gas has also powerful anæsthetic properties. and experiments go to show that it is safe and manageable

It is less irritating than chloroform, it does not excite cough, nor is there any repugnance to the inhalation of it Bromoform. This fluid acts as an agreable anaesthetic. without producing any irritation. whatever, but as it is not an article of easy production, and possessing no superior advantages, it probably will not come into extensive use, Experiments have been made with the nitrous oxide, but its effects are to exciting to allow of its use to much extent as an anaesthetic I shall now proceed to speak more particularly of chloroform & Sulphuric Ether And most of what I have to say will relate to chloroform alone

The use of the ethers by inhalation is no new thing. As early as 1795 we find the inhalation of sulphuric Ether recommended by Dr. Richard Pearson. and it has been used by different persons since that period. As to the question to whom blongs the honor of discovering the anaesthetic powers of the ethers as applied to operative surgery. I will not attempt

to decide. It seems to me that all have been anticipated in the idea by Sir Humphrey Davy, who says (in referring to some experiments upon himself, with nitrous oxide) in its extensive operation, it appears capable of destroying physical pain, and it may probably be used with advantage during surgical operations. Although this extract refers to nitrous oxide gas, yet the principle is precisely the same, as if either chloroform or sulphuric ether had been used. Mr Horace Wells also experimented with the nitrous oxide with regard to its use in surgery. Drs Jackson & Morton of Boston claim the honor of first introducing the use of sulphuric ether by inhalation into the practice of Surgery

Chloroform was discovered by Mr Samuel Guthrie of Sacketts Harbour, N.Y. The first case that I met with, in which it was used by inhalation, is related by Prof. Ives (Sillimans Journal vol XXI Jany 1832) The case was one of pulmonary disease, attended with general debility & difficult respiration

and was effectualy relieved. In March 1847, the action of the pure Chloroform, by inhalation, was tried on the lower animals by Mr Flourens & its effects on the Spinal marrow described. In november of the same year. Doct Simpson of Edinburgh, after experimenting with a number of anasthetics agents, in order to find a substitute for Ether, tried chloroform at the suggestion of Mr Waldo, & having found its effects favourable, brought it forward, as a new remedy for pain, by inhalation in surgery & midwifery

The first question to be decided when any new discovery is brought forward is, is it of any practicable benefit to the receiver, or is that benefit to be counterbalanced by attendent evils of such a magnitude, as to authorize its rejection practicaly aventuly With regard to this discovery, this for a time was no easy matter, there being such a discrepancy of opinion among Medical

men in regard to its modus operandi. its effects so entirly different upon different subjects. producing different effects upon the same subject at different times. I say with the many difficulties to encounter, it was a difficult matter to decide, whether chloroform could be used as an anasthetic agent, with any practicable benefit, to alleviate the sufferings of the human race. But time observation & experience, have demonstrated beyond a doubt, that, the practicioner surgery & Medicine, has an agent at his command. whose power, & practicable utility, in his attempts to heal & restor, the diseases & deformities of his fellow men is of incalculable importance

The question may no properly arise what is the modus operandi of chloroform used as an anæsthetic. It is evident that the vapor being brought in direct contact with the blood, by inhalation, must with it be carried through the circulation. & in this

way be brought in direct contact with the heart, brain & nervous centers. Some contend that when death results from its use, it is caused by congestion of the brain; others, that by being brought in direct contact with the brain, it paralyses the nerves of respiration, thereby causing death; others still claim that its effects are closely allied to Hydrocyanic acid, causing death by paralysing the harts action That the first visible effects are upon the brain, is evident, & the question, whether there is any danger of producing congestion of that organ, I will not attempt to decide, though I think facts are against the doctrine. One case is on record, where a patient was kept under its influence for thirteen hours consecutively. If its tendency is to produce congestion it seems to me, it would have been manifest in this instance. I think the fatal results which would have accrued from its use, such being its tendency, would ere this, banished it entirely from the hands of the medical men

No definitive can be be marked out when its positive effects are produced. it varies exceedingly in different subjects, Neither can any positive symptoms be marked out, as indicative of danger. The only sure guide is the pulse. In some it will sink to an alarming degree. and yet the patient be in no immediate danger. In others it will maintain its natural standard through the whole period of its exhibition. Some writers on the subject say that its effects are accumulative in the system. In some this is apparent. and in others it is not. This being a fact; should serve as a caution to those administering chloroform. It would be very desirable, if some definite symptoms, could be marked out. to enable us to tell precisely when the stage of sopor, is about to merge into that of danger coma. One writer remarks, that the action of the pupils, is the key to this knowledge. He says chloroformization ought not to be continued, one instant, after the pupils previously contracted, have begun to dilate. If unconsciousness can be

secured by sopor. the inhalation should not be carried on. to produce coma. If complete muscular relaxation. be sought for. as in hernia. to facilitate taxis. in dislocation to make reduction easy, and in tetanus, then it will be needfull in general, to urge the patient from sopor into coma. but as soon. as the muscular relaxation is secured the inhalation should cease

It is very important in the administration of chloroform. to have an article perfectly free from all impurities. I have no doubt that many of the accidents which have resulted from its use. could be traced. to this cause, It is very apt to contain alcohol and ether. But the most injurious impurities are the chlorinated pyrogenous oils, the vapour of which (according to Doct Gregory) if inspired or even smelt. causes. distressing sickness and head ache. These oils are detected. by the action of pure and strong sulphuric acid. Pure chloroform, when mixed with an equal volume of the acid. does not colour it but when contaminated with these oils gives the

acid a colour, varying from yellow to reddish brown according to the amount of impurity present
For the presence of alcohol the following test has been recommended, drop into distilled water a small quantity of the chloroform. If pure it remains transparent at the bottom of the glass; but if it contain even a small proportion of alcohol, the globules acquire a milky appearance
As to the mode of administration various methods have been recommended, and various machines invented called inhalers. but, the most simple mode and the one. I believe which is conceded by all at the present time to be the best, is. pouring the substance upon a sponge covered by a Dolly or napkin, and holding it over the mouth of the patient, taking care that a sufficient quantity of atmospheric air be admitted It is the practice of the Surgeons of this place, to use a mixture of sulphuric ether and chloroform, four parts of the ether to one of chloroform. I think one cause of their prejudice against using chloroform alone has arose from the unpleasant effects arising from impurities

The next question which arises is, in what states or conditions of the system, is it admissible or inadmissible There are questions, which are not nor never can be fully decided. When it is evident that there is organic disease either of the heart or lungs. it is considered unsafe to administer it with the view of producing anæsthesia. It may safely be said. I think that chloroform is admissible in all cases (when there is no organic disease of vital organs) till actual experiment proves to the contrary. Some persons who appear to be good subjects for the administration of chloroform, at certain times cannot be brought under its influence, without apparently dangerous consequences ensuing. yet it has not been shown, beyond a doubt that all persons cannot be brought under its influence without danger The fact that you have tried, to day to administer chloroform, to a patient & did not succeed does not prove beyond a doubt that you would not succeed tomorrow. I believe that the susceptibility of the system to these agents is different at different times

We are now ready to enquire what are some of the advantages to be derived, from the administration of chloroform in surgery. In answering this query I shall use the language of a distinguished writer upon the subject. He says. chloroform besides being useful in diminishing the shock of operations. and subsequent reaction. operates beneficially by rendering the after exhibition of opiates unnecessary. And further. the constitutional symptoms have been milder, and the cases have proceeded more satisfactorily, than after the operation in in which no means were taken. to prevent pain. In proof of this I will relate one case out of the many which might be stated. It is that of a man with fungus hematodes of the arm, who was so exhausted by repeated hemorrhages, that he was considered moribund. In the afternoon he made all his arrangements, as though, certain of death. But after awhile he expressed a whish to have the operation performed. Although the case appeared. to be utterly hopeless the surgeon (under whose care the man was) immediatly consented

to operate. and stated that he should administer the chloroform, as from what he had witnessed of its sustaining power in some instances of extreme debility, he expected benefit from it in addition to protecting the patient from the shock of the operation. The ether having been inhaled, for about a minute, the arm was amputated, The patient did not feel pain until after the operation. and dressing had been quite completed, He continued to improve after the operation, & was quite well in a few weeks. The writer deems a further advantage to accrue, from the less need of rapidity, in operating, from an opportunity being given of acting with great deliberation & exposure; and from the composure of the patient. In children these several advantages of anaesthetics become still more prominent. There is a condition in which the surgeon would naturally be extremly cautious in giving chloroform, until experience had fully proved, that they might be employed with safety. This condition is, shock. from an injury When this state is excessive And sensibility is consequently annihilated, a prudent surgeon, would not venture

to give chloroform; nor would it be needed. But when patients have recovered from the first effects of the shock, and though the heart acts feebly, there is sufficient power to admit if necessary of operative proceedings. In such cases chloroform exerts a beneficial effect, acting as a stimulant, saving the hurtful effects of a second shock, inducing a healthy reaction, ~~caution~~ and altogether placing the patient in a more favourable state for recovery, than when such means have not been resorted to. Lastly, when operations are needed in persons reduced by previous illness, or exhausting discharges, Chloroform has helped to support the patient during the operation, and had an exhilerating effect upon the powers of life afterwards. But in such cases it must be borne in mind that their effects are readily and quickly developed: and caution must be observed in their administration

But not to Surgery alone are we to look for all of the beneficial effects of the anæsthetics. From the testimony of eminent Medical men upon the subject we are led to believe, that in the practice of obstetrics, the

accoucher has powerful auxiliary. which in the hands of the carful and judicious. will prove itself to be of no small consequence. I think the anæsthetics have had sufficient time to be tested amply in obstetrical practice. and that the results thus far will justify us in saying that the amount of danger incurred. by their administration is so small. as not to forbid their use when likely to be therapeutically useful. In speaking of chloroform in particular one writer remarks. I administer it in the following classes of cases. In irregular but natural labour. In operative labour. And To facilitate operations upon the uterus In natural labour, the pains are sometimes partially arrested, diminished. or rendered irregular and insufficient. by fear. impatience, want of self control, or by long continued suffering. In such cases the writer remarks. chloroform generally exercises an all but magical effect. Under its influence. all nervous excitement is soothed. the pains gradually become more regular, powerful and efficient. and the labour progresses normally. And may we not expect also that it may be beneficial

in another respect. In the cases above alluded to there is very often a disordered state of the capillaries. I see no reason why we may not expect great benefit to accrue from the sedative effect of the chloroform, thereby lessening the danger of convulsions occuring In cases like the above, I should not deem it necessary to push the remedy, to the extent of producing total unconsciousness so as to annihilate pain entirly, but merely to allay irritability and sensibility, In operative midwifery the only cases in which I should deem its exhibition justifiable, are turning and retained placenta. In these cases, the chief benefit to be expected is in rendering the patient unconscious of pain, and by slightly relaxing, the rigidly contracted uterus In uterine examinations, and operations, in cases where there is acute neuralgic sensibility, of the uterus, its neck, and even the vagina, the use of chloroform might be desirable. Of the many cases on record of the benefits derived from the use of Chloroform, in this class of cases, I will mention only one. A maried lady, for four years, had been been

a martyr to neuralgia of the most intense and agoni
zing description. The neuralgic affection occupied
principally the branches of the fifth pair. the nerves
of the uterus, and occasionally, those of other parts
of the body. and evidently been connected. all along
with, extensive ulcerative disease of the cervix
uteri. The entire pharmacopia had been ransacked
and the most powerful sedatives had been admin
istered for years without any favourable result. A
careful digital examination of the uterus having
brought on a frightful neuralgic attack which
lasted a fortnight. It was determined by the prac—
tioner to put her under the influence of chloroform
He was thus able to bring to light a very extensive
ulceration of the cervix. This organ was lacerated
and the seat of great inflamatory enlargement
The chloroform was administered to the full
surgical extent for fourteen consecutive weeks
(that is fourteen times, to the evident benefit
of the patient, the disease being all but cured
and the morbid sensitiveness, fast disappearing
The writer says she will evidently get quite well

both of the local disease and of the neuralgia which it occasions. In uterine pain from dysmenahea chloroform has been found useful. Administered at bed time, it will often insure freedom from pain and a nights rest when every thing else fails.
In diseases of the nervous system. Neuralgia. Gin Dolereux. Tetanus. Delirium Tremens. Convulsions. In all of them diseases. Chloroform has been administered with the happiest results. In the convulsions of childeren. I think the. Physician has a powerful auxilliary. in chloroform, and one which ought never to be neglected when other means fail

John S Moody